Before the
Federal Communications Commission
Washington, D.C. 20554

ET Docket No. 92-191

In the matter of

Amendment of Section 2.106 of the Commission's Rules to Upgrade to Primary Status the Secondary Mobile-Satellite Service Allocation at 19.7-20.2 GHz and 29.5-30.0 GHz	RM-7511

NOTICE OF PROPOSED RULE MAKING

Adopted: August 14, 1992; Released: September 4, 1992

Comment Date: November 2, 1992
Reply Comment Date: December 2, 1992

By the Commission:

INTRODUCTION

1. By this Notice, the Commission is proposing to upgrade the secondary Mobile-Satellite Service (MSS) allocation at 19.7-20.2 GHz and 29.5-30.0 GHz (20/30 GHz) to shared primary status with the Fixed-Satellite Service (FSS). We take this action in response to a petition for rule making filed by Norris Satellite Communications, Inc. (Norris)[1] and to amendments to the international Table of Frequency Allocations adopted at the recently-concluded International Telecommunications Union (ITU) 1992 World Administrative Radio Conference (WARC-92).[2] The petition and comments filed in response to it persuade us that the MSS allocation at 20/30 GHz should be upgraded to primary status to accommodate satellites that will integrate a variety of services. Our proposed action also conforms with the decision made at WARC-92 to reallocate the 20/30 GHz bands in Region 2 to MSS on a shared primary basis.

BACKGROUND

2. Traditionally, both the Commission on the domestic level and the ITU on the international level have allocated frequency bands for satellite communications based on the classification of services to be provided.[3] As a result of these separate allocations, different services generally are provided from separate dedicated satellites. In certain situations the Commission has permitted in-orbit satellites to provide nonconforming services when it was technically feasible to do so and interference was unlikely to be caused.[4] More recently, we have recognized industry's increasing tendency to develop and implement space platforms that integrate a variety of services.[5] In its recommendations for WARC-92 the Commission, based upon the recommendation of its industry advisory committee, proposed that the 20/30 GHz bands be reallocated internationally for a general-satellite service that would be defined as "a radio communication service using satellites for fixed and mobile applications."[6] While this proposal was not adopted, WARC-92 agreed to upgrade the secondary MSS allocation at 20/30 GHz in Region 2 to primary status shared with FSS.[7]

3. Norris requests reallocation of the 20/30 GHz bands[8] to a new "general-satellite service" (GSS) that would consist of fixed-satellite, mobile-satellite, and broadcasting-satellite services. Norris states that reallocation to GSS is in the public interest because it will enable satellite operators to offer a variety of communications services in the same frequency band, encourage near-term implementation of the 20/30 GHz bands, alleviate pressure on the 1.5/1.6 GHz, 4/6 GHz, and 11/14 GHz satellite bands, promote development of the United States satellite industry, and provide follow-on capacity for users of the National Aeronautical and Space Administration's (NASA) Advanced Communications Technology Satellite (ACTS).[9] Comments generally support the concept of a GSS, but raise issues concerning technical feasibility and spectrum efficiency. The specific elements of Norris' petition and the statements of commenting parties are discussed below.

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[1] *See* Norris petition, RM-7511, filed July 16, 1990. *See* also *Order and Authorization*, 7 FCC Rcd 4289 (1992), granting in part applications 54-DSS-P/L-90 and 55-DSS-P-90.

[2] *See* Final Acts of the World Administrative Radio Conference, Malaga-Torremolinos, 1992 (Final Acts).

[3] *See* 47 C.F.R. § 2.102(a) and Articles 6 and 8 of the ITU Radio Regulations.

[4] *See, e.g., Order and Authorization,* 2670-DSE-MISC-88, 4 FCC Rcd 4538 (1989), at paragraph 6, authorizing Geostar Positioning Corporation to operate a transmission link in the FSS 4/6 GHz bands to provide radiodetermination satellite service to receive-only user terminals.

[5] *See, e.g., Notice of Proposed Rule Making,* GEN Docket No. 90-56, 5 FCC Rcd 1255 (1990) proposing to allocate the 1530-1544 MHz and 1626.5-1645.5 MHz bands for a generic MSS; *see also Report and Order,* GEN Docket Nos. 84-1231, 84-1233, and 84-1234, 2 FCC Rcd 1825 (1986), *recon. denied,* 2 FCC Rcd 6830 (1987), *further recon. denied,* GEN Docket No. 84-1234, 4 FCC Rcd 6016 (1989) allocating the 1545-1559 MHz and 1646.5-1660.5 MHz bands for a generic MSS. In these proceedings, the Commission has pursued generic allocations rather than separate allocations for various types of mobile-satellite services (*e.g.,* aeronautical MSS, land MSS, maritime MSS) as is done internationally.

[6] *See Report,* GEN Docket No. 89-554, 6 FCC Rcd 3900 at paragraph 88 (1991).

[7] *See* Final Acts, WARC-92, *supra,* note 2.

[8] These frequencies currently are allocated to FSS on a primary basis and to MSS on a secondary basis. The 29.95-30.00 GHz band also is allocated to the Earth Exploration Satellite Service on a secondary basis.

[9] NASA plans to launch ACTS in early 1993. This satellite will provide a research vehicle for satellite communications that will use the 20/30 GHz band. ACTS will enable the satellite communications industry to test key technologies and develop new commercial services. These technologies will include 20/30 GHz hardware, "electronically hopping" spot-beam antennas, and two types of on-board signal switches: a baseband processor switch and an intermediate frequency (IF) switch matrix. New services that might be developed include supercomputer access, satellite-based cellular networks, narrowband mobile systems, and a variety of video services.

DISCUSSION

Spectrum Reallocation

4. Norris proposes that the 19.7-20.2 GHz (space-to-Earth) and 29.5-30.0 GHz (Earth-to-space) bands be reallocated to include mobile-satellite and broadcasting-satellite operations. It asserts that reallocation of heretofore unused FSS frequencies to GSS would stimulate implementation of services using the 20/30 GHz bands and alleviate pressure on other satellite frequency bands.

5. NASA and Geostar Messaging Corporation support Norris' proposal. NASA notes that the spectrum proposed for reallocation constitutes only one of the five gigahertz (or 20 percent of the frequencies) allocated to FSS near 20 GHz and 30 GHz. It states that reallocating the 20/30 GHz bands to GSS would allow use of this limited amount of spectrum to be based on actual demand.

6. However, GTE Spacenet Corporation (GTE) expresses concern regarding the effect that broadening the scope of the present allocation would have on future FSS operations in the existing 20/30 GHz allocation. It argues that reallocating the 20/30 GHz bands to GSS would be inefficient use of spectrum because it would have the effect of reducing frequencies available for FSS -- a service, it asserts, with increasing demand -- in favor of MSS and broadcasting-satellite service (BSS) -- services, it asserts, currently with little demand.[10] American Mobile Satellite Corporation joins GTE in requesting that the Commission not view Norris' proposal as a solution to spectrum shortages at other satellite frequency bands because consumer equipment is not yet available for 20/30 GHz.

7. GTE also submits that permitting BSS would reduce orbital efficiency significantly because the relatively highpower service would require orbital spacing of nine degrees, compared with the standard 2-degree spacing used by lower-powered FSS satellites. GTE concludes that only two or three GSS satellites would be able to provide U.S. (CONUS) coverage for BSS, whereas FSS, based on 2-degree spacing, could accommodate 13 satellites.

8. NASA responds that GTE's concerns are not valid because they are based upon technical and political considerations that applied ten years ago to the use of the 12 GHz band, and are not relevant to the future use of the 20/30 GHz bands. Specifically, NASA states that the 9-degree spacing requirement for BSS at 12 GHz was due to the limited earth station discrimination achievable with small user antennas, not to the different levels of equivalent isotropically radiated power (e.i.r.p.) used by FSS and BSS. Additionally, NASA states that 2-degree spacing is possible at 20/30 GHz for FSS and point-to-multipoint operations and that 2 to 3-degree spacing may be possible for mobile and personal communications. Furthermore, NASA predicts that the trend towards higher-power fixed satellites will continue and that trend, when combined with the projected use of spot beams, likely will result in 20/30 GHz signals being substantially equivalent in e.i.r.p. and not require wider orbital spacing if broadcasting services were included.

9. Motorola Satellite Communications, Inc. states that it has filed an application for its IRIDIUM low-earth-orbit (LEO) mobile satellite system that, when fully implemented, will require 100 megahertz in the 18.8-20.2 GHz band and 100 megahertz in the 27.5-30.0 GHz band for gateway and satellite control facility feeder links.[11] It requests that the Commission consider the IRIDIUM system's spectrum requirements in this proceeding as well as in conjunction with the processing of Norris' applications (*see* footnote 1, *supra*).

10. We share the concerns expressed by the commenting parties regarding the limited availability of spectrum. We observe, however, that the spectrum requested by Norris is not used currently by FSS and represents only 20 percent of the frequencies available to FSS between 17 GHz and 30 GHz. Further, we note that WARC-92 recommended that the use of 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 be limited to satellite networks that are both in the fixed-satellite and mobile-satellite services.[12] Therefore, we believe that the impact of the reallocation on FSS would be minimal. We also believe that a multiple service allocation would allow expanded opportunities for other satellite services. Accordingly, we conclude that upgrading the secondary MSS allocation at 20/30 GHz to shared primary status with FSS, in conformity with WARC-92 recommendations, will promote the most efficient use of this spectrum.[13]

General-Satellite Service

11. In its petition, Norris asserts that aggregating various services on the same frequency band would enable satellite operators to better satisfy consumer requirements and achieve economies of scale.

12. In its supporting comments, NASA argues that as a general matter, regulation of services provided by satellites should be based on technical criteria designed to maintain efficient spectrum and orbital utilization, rather than on the end service to be provided.[14] NASA further contends that allocations based on current service definitions are becoming increasingly artificial as technology progresses towards digital communications and as earth stations become increasingly smaller. NASA argues that retaining the existing restrictive service definitions may retard development of new satellite frequency bands. It observes that under the current service definitions it is difficult to introduce new services or to alter services to accommodate changes in demand. Further, NASA argues that: 1) satellite design is unnecessarily complicated by the need to operate in separate frequency bands if multiple services are provided from the same satellite; 2) coordination of satellites providing several services in different bands is difficult; and 3) spectrum and orbital efficiency is lessened by the restrictive service categorization. Consequently, NASA expresses support for adoption of a multi-service definition that would allow satellite operators the flexibility to respond to dynamic market conditions.

13. We agree with NASA that the use of digital transmission and new technologies such as "electronically hopping" spot-beam antennas and on-board switches will reduce the technical differences between MSS and FSS. We also agree that technology, rather than restrictive ser-

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[10] *See* GTE Comments at page 8.
[11] *See* 9-DSS-P-91, filed on December 3, 1990.
[12] *See* Final Acts, WARC-92 footnote No. 873E.
[13] In addition, we propose to continue the secondary allocation for the Earth Exploration-Satellite Service at 29.95-30.00 GHz.
[14] *See* NASA Reply Comments, page 2.

vice definitions, should dictate access to the 20/30 GHz bands to encourage the development of this unused spectrum. Further, we believe that a multi-service allocation will enable satellite operators to respond flexibly to market demands in their use of these bands. For these reasons, we conclude that a shared primary allocation of MSS and FSS, as proposed, permits significant new flexibility and, therefore, is in the public interest.

14. With regard to BSS, we note that the international Table of Frequency Allocations (Table) does not include a broadcasting-satellite service in these bands. International Radio Regulations permit deviation from the Table on the express condition that harmful interference not be caused to services provided by stations operating in accordance with the provisions of the Convention and International Regulations.[15] However, determining the feasibility of operating a BSS without causing such interference will be facilitated only from the results of future ACTS experiments that are planned to demonstrate whether BSS, MSS, and FSS operations are technically compatible on the 20/30 GHz bands. We also note that the current fixed-satellite allocation permits point-to-multipoint operations, which may permit the type of subscription program service envisaged by Norris for BSS.

15. Pending ACTS experimental results, we also invite comment on any technical standards that we should consider. In particular, we request comment on NASA's suggestion to partition the 20/30 GHz bands, each with its own set of standards, to accommodate systems with different antenna gains and modulation techniques.

CONCLUSION

16. In this Notice, we propose to upgrade the secondary MSS 19.7-20.2 GHz and 29.5-30.0 GHz allocation to primary status shared with FSS. We believe that implementing this reallocation will well serve satellite communications needs and maximize efficiency by allowing technology, rather than service boundaries, to determine use of this spectrum. This action is consistent with Commission goals of providing for service to the public utilizing this band and promoting development of innovative U.S. satellite technologies and related industries. Finally, we believe that this action will encourage non-government participation in NASA's ACTS program to determine the viability of a generic satellite service in the 20/30 GHz band and provide a means for follow-on service.

PROCEDURAL MATTERS

A. Ex Parte Rules-Non-Restricted Proceeding

17. This is a non-restricted notice and comment rule making proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules. *See generally* 47 C.F.R. Sections 1.1202, 1.1203, and 1.1206(a).

B. Regulatory Flexibility Analysis

18. The Commission certifies that the Regulatory Flexibility Act of 1980 does not apply to this rule making proceeding because if the proposed rule amendments are promulgated, there will not be a significant economic impact on a substantial number of small business entities, as defined by Section 601(3) of the Regulatory Flexibility Act. Carriers providing interstate transmission lines for telecommunications services affected by the proposed rule amendment generally are large corporations or affiliates of such corporations. The Secretary shall send a copy of this Notice of Proposed Rule Making, including the certification, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act, Public Law No. 96-354, 94 Stat. 1164, 5 U.S.C. Section 601 *et seq* (1981).

C. Notice and Comment Provision

19. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 47 CFR Sections 1.415 and 1.419, interested parties may file comments on or before **November 2, 1992,** and reply comments on or before **December 2, 1992.** To file formally in this proceeding, you must file an original and four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original and nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, D.C. 20554. Comments and reply comments will be available for public inspection during regular business hours in the Dockets Reference Room (Room 239) of the Federal Communications Commission, 1919 M Street, N.W., Washington, DC 20554.

D. Ordering Clause

20. This action is taken pursuant to Sections 4(i), 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 303(c), 303(f), 303(g), and 303(r).

21. For further information concerning this rule making proceeding contact Carl Huie at (202) 653-8112, Office of Engineering and Technology, Federal Communications Commission, Washington, DC 20554.

FEDERAL COMMUNICATIONS COMMISSION

Donna R. Searcy

Donna R. Searcy
Secretary

[15] *See* ITU Radio Regulations No. 342.

APPENDIX

PROPOSED RULE CHANGES

Part 2 of Chapter I of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

PART 2 - FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation in Part 2 would continue to read:

AUTHORITY: Sections 4, 302, 303, and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154, 302, 303, and 307, unless otherwise noted.

2. Section 2.106, the Table of Frequency Allocations is amended as follows:

a. In columns 1, 2, 3, and 5; the band 19.7-20.2 GHz is removed and the bands 19.7-20.1 GHz and 20.120.2 GHz are added, and related footnotes added according to the following table.

b. In columns 1, 2, 3, and 5; the band 29.5-30 GHz is removed and the bands 29.5-29.9 GHz and 29.9-30 GHz are added, and related footnotes added according to the following table.

c. Upon amending the Table of Frequency Allocations, the affected sections will look as follows:

Section 2.106 Table of Frequency Allocations

* * * * *

International table			United States table		FCC use designators	
Region 1 - allocation GHz	Region 2 - allocation GHz	Region 3 - allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
19.7-20.1 FIXED-SATELLITE (space-to-Earth). Mobile-Satellite (space-to-Earth). 873	19.7-20.1 FIXED-SATELLITE (space-to-Earth). MOBILE-SATELLITE (space-to-Earth). 873 873A 873B 873C 873D 873E	19.7-20.1 FIXED-SATELLITE (space-to-Earth). Mobile-Satellite (space-to-Earth). 873	19.7-20.2	19.7-20.1 FIXED-SATELLITE (space-to-Earth). MOBILE-SATELLITE (space-to-Earth). 873A 873B 873C 873D 873E		
20.1-20.2 FIXED-SATELLITE (space-to-Earth). MOBILE-SATELLITE (space-to-Earth). 873 873A 873B 873C 873D				20.1-20.2 FIXED-SATELLITE (space-to-Earth). MOBILE-SATELLITE (space-to-Earth). 873A 873B 873C 873D		

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International table			United States table		FCC use designators	
Region 1 - allocation GHz	Region 2 - allocation GHz	Region 3 - allocation GHz	Government Allocation GHz	Non-Government Allocation GHz	Rule part(s)	Special-use frequencies
(1)	(2)	(3)	(4)	(5)	(6)	(7)
*	*	*	*	*		*
29.5-29.9 FIXED-SATELLITE (Earth-to-space) 882W Mobile-Satellite (Earth-to-space). Earth Exploration-Satellite (Earth-to-space) 882C 882B 883	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 882W MOBILE-SATELLITE (Earth-to-space). Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 873E 882B 883	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 882W Mobile-Satellite (Earth-to-space). Earth Exploration-Satellite (Earth-to-space) 882C 882B 883	29.5-30.0	29.5-29.9 FIXED-SATELLITE (Earth-to-space). MOBILE-SATELLITE (Earth-to-space). 873A 873B 873C 873E		
29.9-30	FIXED-SATELLITE (Earth-to-space) 882W MOBILE-SATELLITE (Earth-to-space). Earth Exploration-Satellite (Earth-to-space) 882C 873A 873B 873C 882 882A 882B 883			29.9-30.0 FIXED-SATELLITE (Earth-to-space). MOBILE-SATELLITE (Earth-to-space). 873A 873B 873C 882		
*	*	*	*	*		*

d. INTERNATIONAL FOOTNOTES Nos. 873 and 883 are revised, and Nos. 873A, 873B, 873C, 873D, 873E, 882A, 882B, 882C, and 882W are added:

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873

Additional allocation: in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brazil, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Niger, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Singapore, Somalia, Sudan, Sri Lanka, Tanzania, Chad, Thailand, Togo, Tunisia, and Zaire, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where such allocation to the mobile-satellite service is on a primary basis in the latter band.

873A

In order to facilitate interregional coordination between networks in the mobile satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7-20.2 GHz and 29.5-30 GHz.

873B

In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

873C

In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No. 953 do not apply with respect to the mobile-satellite service.

873D

The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. 873.

873E

The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. 873B.

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882A

Additional allocation: the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up link power control.

Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500-27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in No. 2578 on the Earth's surface.

882B

Additional allocation: the band 27.501-29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up link power control.

882C

In the band 28.5-30GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

882W

The band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

883

Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, the Republic of Korea, Egypt, the United Arab Emirates, Ethiopia, Guinea, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Niger, Pakistan, Qatar, Syria, Singapore, Somalia, Sudan, Sri Lanka, Chad,

and Thailand, the band 29.5-31GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. 2505 and 2508 shall apply.

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